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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,664	05/31/2001	Yoshihide Fukuoka	MES1P039	4059
22434	7590	05/19/2004	EXAMINER	
BEYER WEAVER & THOMAS LLP			LU, TOM Y	
P.O. BOX 778			ART UNIT	
BERKELEY, CA 94704-0778			PAPER NUMBER	

2621

DATE MAILED: 05/19/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/786,664

Applicant(s)

FUKUOKA ET AL.

Examiner

Tom Y Lu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14 and 16 is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 9, 11-13 and 15 is/are rejected.
- 7) ☒ Claim(s) 6-7 and 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

1. Claim 1-5, 8-9, 11 and 12/1 are rejected under 35 U.S.C. 102(a) as being anticipated by Ó Ruanaidh et al (“Phase Watermarking of Digital Images”, Image Processing, 1996. Proceedings., International Conference on , Volume: 3 , 16-19 Sept. 1996).

a. Referring to Claim 1, Ó Ruanaidh discloses a) causing the master data to be subjected to a discrete Fourier transform (original image as shown in figure 3 is subjected to discrete Fourier transform in section 2.1); b) adding a minute variation (δ in section 2.1 is the claimed “a minute variation” added to the phase of every DFT value), which corresponds to a phase difference pattern determined in advance as the watermark information (δ is the phase difference between phase $\angle F(k_1, k_2)$ and phase $\angle F(k_1, k_2) + \delta$), to either one of real number array and an imaginary number array of the master data obtained by the discrete Fourier transform (by subjecting to DFT, there are only two values, real number and imaginary number, therefore, $F(k_1, k_2)$ is either real number or imaginary number), so as to generate resulting data ($\angle F(k_1, k_2) + \delta$ is the claimed resulting data) with the minute variation added thereto; and c) causing the resulting data with the minute variation added thereto to be subjected to inverse Fourier transform, so as to generate authorized data with the watermark information embedded therein (by subjecting to inverse DFT transform as shown in equation 2, the watermarked data, figure 4 is the claimed “authorized data”).

- b. Referring to Claim 2, Ó Ruanaidh discloses wherein said step b) adds a minute variation ΔF to a spectrum $F(m, n)$ of a specific frequency (m, n) in either one of the real number array and the imaginary number array (see section 2.1, equation 4).
- c. Referring to Claim 3, Ó Ruanaidh discloses wherein said step b) carries out the addition of the minute variation ΔF while keeping symmetry of either one of the real number array and the imaginary number array (see section 2.1, equation 4).
- d. Referring to Claim 4, Ó Ruanaidh discloses wherein the minute variation added is within a range of 2 to 10% of the spectrum (as shown in figure 5, there is some watermark information is added in a range of 2 to 10% of the spectrum).
- e. Referring to Claim 5, Ó Ruanaidh discloses wherein either one of the real number array and the imaginary number array, to which the minute variation is added in step b) is a component in a low frequency domain (even though Ó Ruanaidh teaches most of the watermark information is embedded around the edges, section 5, however, as shown in figure 5, there is some watermark information embedded in smooth, low frequency area).
- f. Referring to Claim 8, Ó Ruanaidh discloses wherein the master data is two-dimensional image data (see figure 3).
- g. Referring to Claim 9, Ó Ruanaidh discloses taking out a difference between the master data and the authorized data as a phase difference pattern; and detecting the phase difference pattern as a digital watermark of the authorized data (see section 5).
- h. Referring to Claim 11, Ó Ruanaidh discloses d) taking out a difference between the master data P_0 and the data P_i with the other phase difference patterns embedded therein the plurality of times; e) taking out a difference between the authorized data P_1 and the data P_i with the other phase difference patterns embedded therein the plurality of times; and f)

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extracting an eventual difference between the difference taken out in step d) and the difference taken out in said step e) as the legal phase difference pattern W1 (see section 5, and figures 3-5).

i. Referring to Claim 12/1, Ó Ruanaidh discloses g) taking out a difference between the master data Q0 and the data Qi with the other phase difference patterns embedded therein the plurality of times; h) taking out a difference between the authorized data Q1 and the data Pi with the other phase difference patterns embedded therein the plurality of times; and i) extracting an eventual difference between the difference taken out in step g) and the difference taken out in said step h) as the legal phase difference pattern W1 (see section 5, and figures 3-5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ó Ruanaidh in view of Wang et al (U.S. Patent No. 6,252,971 B1). The arguments in Paragraph 1.a above as to the applicability of Ó Ruanaidh are incorporated herein.

a. With regard to Claim 13, the only difference between Claim 1 and Claim 13 is Claim 13 calls for an apparatus. Ó Ruanaidh teaches a method of embedding an invisible watermark in an image. However, Ó Ruanaidh does not disclose the method can be used to construct a watermarking system. Wang teaches applying a watermarking method to construct a watermarking system at column 1, line 45. At the time the

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invention was made, a person of ordinary skill in the art would have been motivated to use a watermarking method to construct a watermarking system because it is reasonable to assume a person of ordinary skill in the art would like to transform a theoretical method to an actual system for commercial purpose.

- b. With regard to Claim 15, the only difference between Claim 1 and Claim 15 is Claim 15 calls for a storage medium. Wang teaches the system is a computer system which inherently includes a computer readable storage medium.

Allowable Subject Matter

3. Claims 6-7, 10 and 12/6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

- a. Claim 6 defines features steps of a0) causing the master data to be subjected to a predetermined data transform, which converts the master data to a specific data form that enables an area mainly corresponding to a low frequency component to be specified, prior to the discrete Fourier transform in step a); and ax) carrying out an inverse transform of the predetermined data transform performed in said step a0), after the inverse Fourier transform in step c), wherein said step a) causes a specific data portion, which represents the area mainly corresponding to the low frequency component and is selected out of the data converted in said step (a0), to be subjected to the discrete Fourier transform. These feature steps in Claim 6, which is the broadest allowable claim, are not taught or suggested by the art of record.
- b. Claims 7, 10 and 12/6 are dependent upon Claim 6.

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4. Claims 14 and 16 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Independent Claim 14 and 16 incorporate the same allowable subject matter as indicated in allowable claim 6 above.

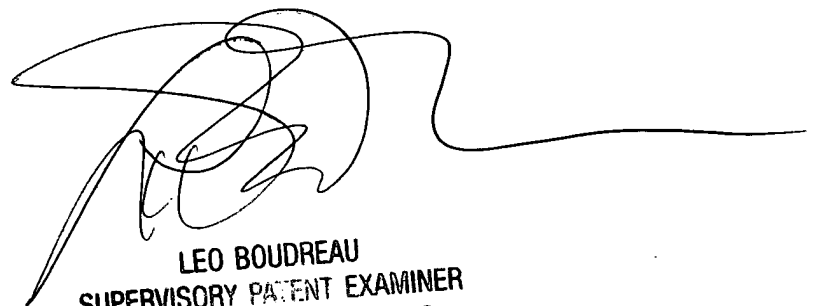
Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Y Lu whose telephone number is (703) 306-4057. The examiner can normally be reached on 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Y. Lu



LEO BOUDREAU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600